Amendments to the Claims:

Please amend claim 44. A complete list of claims are shown for the Examiners reference.

Claims:

1. (original) A decoding process comprising:

scaling a block of coefficients using a scaling factor determined for each coefficient by computing an index for said each coefficient and indexing a look-up table (LUT) using the index, wherein the index is based on a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block; and

applying a transform to the block of scaled coefficients.

2. (original) The decoding process defined in Claim 1 wherein the index is the sum of the quantization parameter and a first value determined by block size of the block of coefficients and the position of said each coefficient within the block.

3. (original) The decoding process defined in Claim 2 wherein the first value is the sum of a second value determined by the vertical size of the block and the vertical position of said each coefficient within the block and a third value determined by the horizontal size of the block and the horizontal position of said each coefficient within the block.

4. (original) The decoding process defined in Claim 3 wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8.

5. (original) The decoding process defined in Claim 1 wherein the LUT is used independently of the block size, such that one LUT supports use the transform being one of a plurality of sizes.

6. (original) The decoding process defined in Claim 1 further comprising:

determining an offset of an array according to the position of said each coefficient;

determining an inverse quantization value for said each coefficient based on the offset.

7. (original) The decoding process defined in Claim 6 wherein entries of the array are of a form pow(2, (k+O)/12), where k represents a position of an individual entry in the array and O is a constant.

8. (original) The decoding process defined in Claim 6 wherein the array is a 1-dimensional (1-D).

9. (original) The decoding process defined in Claim 1 wherein applying a transform to the block of scaled coefficients comprises:

applying a vertical transform to the block of scaled coefficients; and

applying a horizontal transform to block of scaled coefficients.

10. (original) The decoding process defined in Claim 1 wherein the basis vectors of the transform are:

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8

and represent an 8-point transform used for blocks that have one or both of horizontal and vertical size of 8.

11. (original) The decoding process defined in Claim 1 wherein applying the transform to the block of scaled coefficients comprises computing the transform using only a sequence of addition, subtraction, and shift operations.

12. (original) The decoding process defined in Claim 1 wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8.

13. (original) A decoder comprising:

a look-up table;

an inverse quantizer to scale a block of coefficients using a scaling factor determined for each coefficient by computing an index for said each coefficient and indexing the LUT using the index, wherein the index is based on a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block; and

an inverse transform unit to applying a transform to the block of scaled coefficients.

14. (original) The decoder defined in Claim 13 wherein the index is the sum of the quantization parameter and a first value determined by block size of the block of coefficients and the position of said each coefficient within the block.

15. (original) The decoder defined in Claim 14 wherein the first value is the sum of a second value determined by the vertical size of the block and the vertical position of said each coefficient within the block and a third value determined by the horizontal size of the block and the horizontal position of said each coefficient within the block.

16. (original) The decoder defined in Claim 15 wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8.

17. (original) The decoder defined in Claim 13 wherein the LUT is used independently of the block size, such that one LUT supports use the transform being one of a plurality of sizes.

18. (original) The decoder defined in Claim 13 wherein the inverse quantizer scales a block of coefficients using a scaling factor by

determining an offset of an array according to the position of said each coefficient;

determining an inverse quantization value for said each coefficient based on the offset.

19. (original) The decoder defined in Claim 18 wherein entries of the array are of a form pow(2, (k+O)/12), where k represents a position of an individual entry in the array and O is a constant.

20. (original) The decoder defined in Claim 18 wherein the array is a 1-dimensional (1-D).

21. (original) The decoder defined in Claim 13 wherein the transform unit applies the transform to the block of scaled coefficients by

applying a vertical transform to the block of scaled coefficients; and

applying a horizontal transform to block of scaled coefficients.

22. (original) The decoder defined in Claim 13 wherein the basis vectors of the transform are:

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8

and represent an 8-point transform used for blocks that have one or both of horizontal and vertical size of 8.

23. (original) The decoder defined in Claim 13 wherein the transform unit computes the transform using only a sequence of addition, subtraction, and shift operations.

24. (original) The decoder defined in Claim 13 wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8.

25. (original) An article of manufacture comprising one or more recordable media storing instructions which, when executed by a system, cause the system to:

scale a block of coefficients using a scaling factor determined for each coefficient by computing an index for said each coefficient and indexing a look-up table (LUT) using the index, wherein the index is based on a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block; and

apply a transform to the block of scaled coefficients.

26. (original) The article of manufacture defined in Claim 25 wherein the index is the sum of the quantization parameter and a first value determined by block size of the block of coefficients and the position of said each coefficient within the block.

27. (original) The article of manufacture defined in Claim 26 wherein the first value is the sum of a second value determined by the vertical size of the block and the vertical position of said each coefficient within the block and a third value determined by the horizontal size of the block and the horizontal position of said each coefficient within the block.

28. (original) The article of manufacture defined in Claim 25 wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8.

29. (original) The article of manufacture defined in Claim 25 wherein the LUT is used independently of the block size, such that one LUT supports use the transform being one of a plurality of sizes.

30. (original) A decoding apparatus comprising:

means for scaling a block of coefficients using a scaling factor determined for each coefficient by computing an index for said each coefficient and indexing a look-up table (LUT) using the index, wherein the index is based on a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block; and

means for applying a transform to the block of scaled coefficients.

31. (original) A decoding process comprising:

scaling a block of coefficients using a scaling factor determined for each coefficient by computing an index for said each coefficient and indexing a look-up table (LUT) using the index, wherein the index is based on a quantization parameter and a position of said each coefficient within the block; and

applying a vertical transform and a horizontal transform to the block of scaled coefficients, wherein basis vectors of the vertical and horizontal transforms are

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8,

or multiples thereof.

32. (original) The decoding process defined in Claim 31 wherein the index is a sum of the quantization parameter, a first value determined by a vertical position of said each coefficient within the block and a second value determined by a horizontal position of said each coefficient within the block.

33. (original) The decoding process defined in Claim 31 wherein applying the transform comprises computing the transform using only a sequence of addition, subtraction and shift operations.

34. (original) The decoding process defined in Claim 31 wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8.

35. (original) The decoding process defined in Claim 31 wherein the LUT is used independently of the block size, such that one LUT supports use the transform being one of a plurality of sizes.

36. (original) The decoding process defined in Claim 31 wherein applying a transform to the block of scaled coefficients comprises:

applying a vertical transform to the block of scaled coefficients; and

applying a horizontal transform to block of scaled coefficients.

37. (original) A decoder comprising:

an inverse quantizer to scale a block of coefficients using a scaling factor determined for each coefficient by computing an index for said each coefficient and indexing a look-up table (LUT) using the index, wherein the index is based on a quantization parameter and a position of said each coefficient within the block; and

an inverse transform to apply a vertical transform and a horizontal transform to the block of scaled coefficients, wherein basis vectors of the vertical and horizontal transforms are

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8,

or multiples thereof.

38. (original) The decoder defined in Claim 37 wherein the index is a sum of the quantization parameter, a first value determined by a vertical position of said each coefficient within the block and a second value determined by a horizontal position of said each coefficient within the block.

39. (original) The decoder defined in Claim 37 wherein applying the transform comprises computing the transform using only a sequence of addition, subtraction and shift operations.

40. (original) The decoder defined in Claim 37 wherein applying a transform to the block of scaled coefficients comprises:

applying a vertical transform to the block of scaled coefficients; and

applying a horizontal transform to block of scaled coefficients.

41. (original) An article of manufacture comprising one or more recordable media storing instructions which, when executed by a system, cause the system to:

scale a block of coefficients using a scaling factor determined for each coefficient by computing an index for said each coefficient and indexing a look-up table (LUT) using the index, wherein the index is based on a quantization parameter and a position of said each coefficient within the block; and

apply a vertical transform and a horizontal transform to the block of scaled coefficients, wherein basis vectors of the vertical and horizontal transforms are

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8

1/2 -1 1 -1/2 -1/2 1 -1 1/2

3/8 -6/8 10/8 -12/8 12/8 -10/8 6/8 -3/8,

or multiples thereof.

42. (original) The article of manufacture defined in Claim 41 wherein the index is a sum of the quantization parameter, a first value determined by a vertical position of said each coefficient within the block and a second value determined by a horizontal position of said each coefficient within the block.

43. (original) The article of manufacture defined in Claim 41 wherein instructions to cause the system to apply the transform comprise instructions which, when executed by the system, cause the system to compute the transform using only a sequence of addition, subtraction and shift operations.

44. (original) The article of manufacture defined in Claim ~~5415~~ 41 wherein instructions to cause the system to apply the transform to the block of scaled coefficients comprise instructions which, when executed by the system, cause the system to:

apply a vertical transform to the block of scaled coefficients; and

apply a horizontal transform to block of scaled coefficients.

45. (original) A decoder comprising:

means for scaling a block of coefficients using a scaling factor determined for each coefficient by computing an index for said each coefficient and indexing a look-up

table (LUT) using the index, wherein the index is based on a quantization parameter and a position of said each coefficient within the block; and

means for applying a vertical transform and a horizontal transform to the block of scaled coefficients, wherein basis vectors of the vertical and horizontal transforms are

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8,

or multiples thereof.

46. (original) A decoding method including:

scaling a block of coefficients using a scaling factor determined for each coefficient by computing an index for said each coefficient and indexing a look-up table (LUT) using the index, wherein the index is based on a quantization parameter and a position of said each coefficient within the block; and

applying a vertical transform and a horizontal transform to the block of scaled coefficients, where basis vectors of the vertical and horizontal transform are

1	1	1	1
5/4	1/2	-1/2	-5/4

1 -1 1 -1

1/2 -5/4 5/4 -1/2,

or multiples thereof.

47. (original) The decoding process defined in Claim 46 wherein the index is a sum of the quantization parameter, a first value determined by a vertical position of said each coefficient within the block and a second value determined by a horizontal position of said each coefficient within the block.

48. (original) The decoding process defined in Claim 46 wherein applying the transform comprises computing the transform using a sequence of only addition, subtraction and shift operations.

49. (original) The decoding process defined in Claim 46 wherein applying a transform to the block of scaled coefficients comprises:

applying a vertical transform to the block of scaled coefficients; and

applying a horizontal transform to block of scaled coefficients.

50. (original) A decoder comprising:

an inverse quantizer to scale a block of coefficients using a scaling factor determined for each coefficient by computing an index for said each coefficient and indexing a look-up table (LUT) using the index, wherein the index is based on a quantization parameter and a position of said each coefficient within the block; and

an inverse transform to apply a vertical transform and a horizontal transform to the block of scaled coefficients, wherein basis vectors of the vertical and horizontal transforms are

1	1	1	1
5/4	1/2	-1/2	-5/4
1	-1	1	-1
1/2	-5/4	5/4	-1/2,

or multiples thereof.

51. (original) The decoder defined in Claim 50 wherein the index is a sum of the quantization parameter, a first value determined by a vertical position of said each coefficient within the block and a second value determined by a horizontal position of said each coefficient within the block.

52. (original) The decoder defined in Claim 50 wherein applying the transform comprises computing the transform using only a sequence of addition, subtraction and shift operations.

53. (original) The decoder defined in Claim 50 wherein applying a transform to the block of scaled coefficients comprises:

applying a vertical transform to the block of scaled coefficients; and

applying a horizontal transform to block of scaled coefficients.

54. (original) An article of manufacture comprising one or more recordable media storing instructions which, when executed by a system, cause the system to:

scale a block of coefficients using a scaling factor determined for each coefficient by computing an index for said each coefficient and indexing a look-up table (LUT) using the index, wherein the index is based on a quantization parameter and a position of said each coefficient within the block; and

apply a vertical transform and a horizontal transform to the block of scaled coefficients, wherein basis vectors of the vertical and horizontal transforms are

1	1	1	1
5/4	1/2	-1/2	-5/4
1	-1	1	-1
1/2	-5/4	5/4	-1/2,

or multiples thereof.

55. (original) The article of manufacture defined in Claim 54 wherein the index is a sum of the quantization parameter, a first value determined by a vertical position of said each coefficient within the block and a second value determined by a horizontal position of said each coefficient within the block.

56. (original) The article of manufacture defined in Claim 54 wherein instructions to cause the system to apply the transform comprise instructions which, when executed by the system, cause the system to compute the transform using only a sequence of addition, subtraction and shift operations.

57. (original) The article of manufacture defined in Claim 54 wherein instructions to cause the system to apply the transform to the block of scaled coefficients comprise instructions which, when executed by the system, cause the system to:

apply a vertical transform to the block of scaled coefficients; and

apply a horizontal transform to block of scaled coefficients.

58. (original) A decoder comprising:

means for scaling a block of coefficients using a scaling factor determined for each coefficient by computing an index for said each coefficient and indexing a look-up table (LUT) using the index, wherein the index is based on a quantization parameter and a position of said each coefficient within the block; and

means for applying a vertical transform and a horizontal transform to the block of scaled coefficients, wherein basis vectors of the vertical and horizontal transforms are

1	1	1	1
5/4	1/2	-1/2	-5/4
1	-1	1	-1
1/2	-5/4	5/4	-1/2,

or multiples thereof.

59. (previously presented) A decoding process comprising:

scaling a block of coefficients using a scaling factor determined for each coefficient in the block of coefficients by computing an index for one or more

coefficients and indexing a look-up table (LUT) using the index for at least one coefficient; and

converting the block of scaled coefficients to a block of output values by transforming each row of the block of scaled coefficients using a one-dimensional inverse transform to create a block of transformed coefficients and then, after transforming all rows of the block of scaled coefficients, transforming each column of the block of transformed coefficients individually using the one-dimensional inverse transform to create the block of output values, the one-dimensional inverse transform being mathematically equivalent to the following:

a[0] = in[0] + in[4]; a[4] = in[0] - in[4]; a[2] = (in[2]>>1) – in [6]; a[6] = in[2] + (in[6]>>1);
b[0] = a[0] + a[6]; b[2] = a[4] + a[2]; b[4] = a[4] - a[2]; b[6] = a[0] - a[6];
a[1] = -in[3] + in[5] – in[7] – (in[7]>>1); a[3] = in[1] + in[7] – in[3] – (in[3]>>1);
a[5] = -in[1] + in[7] + in[5] + (in[5]>>1); a[7] = in[3] + in[5] + in[1] + (in[1]>>1);
b[1] = a[1] + (a[7]>>2); b[7] = -(a[1] >>2) + a[7]; b[3] = a[3] + (a[5]>>2); b[5] = a[3] >>2) – a[5];
out[0] = b[0] + b[7]; out[1] = b[2] + b[5]; out[2] = b[4] + b[3]; out[3] = b[6] + b[1];
out[4] = b[6] - b[1]; out[5] = b[4] - b[3]; out[6] = b[2] - b[5]; out[7] = b[0] - b[7].

wherein the in[x] represent coefficients in the input vector retrieved from an input block and the out[x] represent coefficients of the output vector for use in forming an output block, where x is an integer variable from 0 to 7, and further wherein bitwise operator y >> z represents an arithmetic right shift of y by z binary digits.

60. (previously presented) The decoding process defined in Claim 59 wherein the index for one coefficient is based on a quantization parameter, a size of the block of coefficients, and a position of the one coefficient within the block.

61. (previously presented) A decoder comprising:

an inverse quantizer to scale a block of coefficients using a scaling factor determined for each coefficient by computing an index for at least one coefficient and indexing a look-up table (LUT) using the index, wherein the index is based on a quantization parameter and a position of the one coefficient within the block; and

an inverse transform to convert the block of scaled coefficients to a block of output values by transforming each row of the block of scaled coefficients using a one-dimensional inverse transform to create a block of transformed coefficients and then, after transforming all rows of the block of scaled coefficients, transforming each column of the block of transformed coefficients individually using the one-dimensional inverse transform to create the block of output values, the one-dimensional inverse transform being mathematically equivalent to the following:

a[0] = in[0] + in[4]; a[4] = in[0] - in[4]; a[2] = (in[2]>>1) – in [6]; a[6] = in[2] + (in[6]>>1);
b[0] = a[0] + a[6]; b[2] = a[4] + a[2]; b[4] = a[4] - a[2]; b[6] = a[0] - a[6];
a[1] = -in[3] + in[5] – in[7] – (in[7]>>1); a[3] = in[1] + in[7] – in[3] – (in[3]>>1);
a[5] = -in[1] + in[7] + in[5] + (in[5]>>1); a[7] = in[3] + in[5] + in[1] + (in[1]>>1);
b[1] = a[1] + (a[7]>>2); b[7] = -(a[1] >>2) + a[7]; b[3] = a[3] + (a[5]>>2); b[5] = a[3] >>2) – a[5];
out[0] = b[0] + b[7]; out[1] = b[2] + b[5]; out[2] = b[4] + b[3]; out[3] = b[6] + b[1];
out[4] = b[6] - b[1]; out[5] = b[4] - b[3]; out[6] = b[2] - b[5]; out[7] = b[0] - b[7].

wherein the in[x] represent coefficients in the input vector retrieved from an input block and the out[x] represent coefficients of the output vector for use in forming an output block, where x is an integer variable from 0 to 7, and further wherein bitwise operator y >> z represents an arithmetic right shift of y by z binary digits.

62. (previously presented) The decoder defined in Claim 61 wherein the index for one coefficient is based on a quantization parameter, a size of the block of coefficients, and a position of the one coefficient within the block.

63. (previously presented) An article of manufacture comprising one or more recordable media storing instructions which, when executed by a system, cause the system to perform a method comprising:

scaling a block of coefficients using a scaling factor determined for each coefficient in the block of coefficients by computing an index for one or more coefficients and indexing a look-up table (LUT) using the index for at least one coefficient; and

converting the block of scaled coefficients to a block of output values by transforming each row of the block of scaled coefficients using a one-dimensional inverse transform to create a block of transformed coefficients and then, after transforming all rows of the block of scaled coefficients, transforming each column of the block of transformed coefficients individually using the one-dimensional inverse transform to create the block of output values, the one-dimensional inverse transform being mathematically equivalent to the following:

a[0] = in[0] + in[4]; a[4] = in[0] - in[4]; a[2] = (in[2]>>1) – in [6]; a[6] = in[2] + (in[6]>>1);
b[0] = a[0] + a[6]; b[2] = a[4] + a[2]; b[4] = a[4] - a[2]; b[6] = a[0] - a[6];
a[1] = -in[3] + in[5] – in[7] – (in[7]>>1); a[3] = in[1] + in[7] – in[3] – (in[3]>>1);
a[5] = -in[1] + in[7] + in[5] + (in[5]>>1); a[7] = in[3] + in[5] + in[1] + (in[1]>>1);
b[1] = a[1] + (a[7]>>2); b[7] = -(a[1] >>2) + a[7]; b[3] = a[3] + (a[5]>>2); b[5] = a[3] >>2) – a[5];

out[0] = b[0] + b[7]; out[1] = b[2] + b[5]; out[2] = b[4] + b[3]; out[3] = b[6] + b[1]; out[4] = b[6] - b[1]; out[5] = b[4] - b[3]; out[6] = b[2] - b[5]; out[7] = b[0] - b[7].

wherein the in[x] represent coefficients in the input vector retrieved from an input block and the out[x] represent coefficients of the output vector for use in forming an output block, where x is an integer variable from 0 to 7, and further wherein bitwise operator y >> z represents an arithmetic right shift of y by z binary digits.

64. (previously presented) The article of manufacture defined in Claim 63 wherein the index for one coefficient is based on a quantization parameter, a size of the block of coefficients, and a position of the one coefficient within the block.